ENGINEERING DIVISION
U.S. ARMY ENGINEER REACTORS GROUP
CORPS OF ENGINEERS
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1968 ANNUAL SUMMARY REPORT ENVIRONMENTAL RADIATION MONITORING PROGRAM SM-1A NUCLEAR POWER PLANT FORT GREELY, ALASKA

LYNN C. CLEMENTS
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ABSTRACT

This report presents tables of the environmental radiation monitoring data collected during the period 1 January 1968 to 31 December 1968. The report concludes that the background radioactivity was at or very near the minimum detectable activity of the counting system employed and that it is believed the background activity did not increase significantly.

FOREWORD

The investigation described in this report was conducted by the Environmental Monitoring Section of the Fort Greely Post Surgeon. The results of the investigation were analyzed and summarized by the Source Licensing and Environmental Monitoring Section of the Industrial Engineering and Support Branch, Engineering Division, U. S. Army Engineer Reactors Group, Fort Belvoir, Virginia.

CONTENTS

ENVIRONMENTAL RADIATION MONITORING PROGRAM AT FORT GREELY, ALASKA

I. INTRODUCTION

1. This report summarizes the results of the Environmental Radiation Monitoring Program at Fort Greely for the period 1 January 1968 - 31 December 1968.

2. The purpose of this program is to provide an independent evaluation of the effects of the operation of the SM-1A reactor on the surrounding environment.

II. INVESTIGATION

1. All samples were processed and analyzed for gross beta-gamma activity. The capability to determine gross alpha activity was not available during the year 1968.

2. When the counting error at the 95% confidence level exceeds 40% of the net count rate of the sample, the data is rejected as unreliable.

3. Sampling Schedule.

The following sampling schedule will be observed except when precluded by weather conditions. Vegetation samples may be taken at the discretion of the Environmental Monitor.

a. Water Samples:

(1) Station 101 (background).
Location - One-half mile upstream from the SM-1A liquid waste discharge on Jarvis Creek.
Frequency - Three samples each week.

(2) Station 102
Location - Jarvis Creek at the Richardson Highway Bridge
Frequency - Three samples each week.

(3) Station 103
Location - Delta River, between the Jarvis Creek junction and the Tanana River junction.
Frequency - One sample each week.

(4) Station 104
Location - Domestic water supply.
Frequency - One sample every two weeks. (year-round)

b. Air Samples:

(1) Station 201
Location - Vicinity of Bldg T-508.
Frequency - One sample every two weeks.

(2) Station 202
Location - Vicinity of Old Post.
Frequency - One sample every two weeks.

c. Soil Samples:

(1) Station 301
Location - Approximately 100-200 ft. North of SM-1A.
Frequency - Two samples every two weeks.

(2) Station 302
Location - Rod and Gun Club.
Frequency - One sample each month.

d. Particulate Fallout Samples:

(1) Station 401
Location - Point 1, Figure I.
Frequency - One sample each week.

(2) Station 402
Location - Point 2, Figure I.
Frequency - One sample each week.

(3) Station 403
Location - Point 3, Figure I.
Frequency - One sample each week.

(4) Station 404
Location - Point 4, Figure I.
Frequency - One sample each week.

(5) Station 405
Location - Point 5, Figure I.
Frequency - One sample each week.

(6) Station 406
Location - Point 6, Figure I.
Frequency - One sample each week.

(7) Station 407
Location - Point 7, Figure I.
Frequency - One sample each week.

(8) Station 408
Location - Point 8, Figure I.
Frequency - One sample each week.

(9) Station 409 (background).
Location - Point 9, Figure I.
Frequency - One sample each week.

e. Fish Samples:

(1) Station
Location - Tanana River, vicinity of Shaw Creek.
Frequency - Five samples each month during fishing season.

f. Sediment Samples:

(1) Station 701
Location - One-half mile upstream from the SM-1A liquid waste discharge on Jarvis Creek. (Same as Station 101)
Frequency - One sample each week.

(2) Station 702
Location - Approximately 100-200 ft. downstream from SM-1A liquid waste discharge on Jarvis Creek.
Frequency - One sample each week.

(3) Station 703
Location - Jarvis Creek at the Richardson Highway Bridge. (Same as Station 102)
Frequency - One sample each week.

*Note: Sediment samples will be collected on Jarvis Creek during the time of no flow or small flow, 30 days prior to annual discharge of liquid waste, and 30 days after annual discharge of liquid waste has ceased. It is anticipated that during discharge of liquid waste, the sediment content in the water will be high enough to warrant separation type processing of water and silt.

III. DISCUSSION

1. Table A presents a summary of the data collected for 1968 and provides a comparison of each quarter of 1968.

2. The data presented for this period are not considered statistically reliable. The techniques used in processing and counting the samples were inadequate for the low activities involved and were not those prescribed in the "Environmental Radiation Monitoring Plan for SM-1A Nuclear Power Plant,

Fort Greely, Alaska." However, it is believed that the techniques used could detect a significant increasing trend in the beta-gamma activity. During a visit to Fort Greely in September 1968, the problems encountered in the techniques of processing and counting samples were discussed with the Fort Greely Post Surgeon and Environmental Monitor. These problems were resolved to the best of the ability of the Post Surgeon and the counting equipment available.

3. The low beta counting system needed to obtain statistically reliable data and provide the capability to determine gross alpha activity could not be made available for the Post Surgeon's use during 1968. This was due to a contract repair problem. The low beta counting system did become operational in January 1969.

4. Soil Samples, Fish Samples, and Sediment Samples were not collected during 1968, as per the Environmental Radiation Monitoring Plan. It should be noted concerning the collection of Sediment Samples, that there was no discharge of liquid waste to Jarvis Creek during 1968.

5. The responsibility for the Environmental Radiation Monitoring Program for Fort Greely was assumed by the SM-1A Branch, USAERG, on 1 January 1969.

IV. CONCLUSION

The environmental radioactivity at Fort Greely is at or very close to the minimum detectable activity of the counting system employed. Based on the data available, it is believed that the radiological background did not increase significantly since the techniques used would have detected such an increase.

REFERENCES

1. Guidelines for Environmental Radiological Monitoring at U. S. Army Nuclear Reactors Facilities; Letter from J. C. Lambert, Major General, Adjutant General; 20 October 1965.

2. Environmental Radiation Monitoring Plan for SM-1A Nuclear Power Plant, Fort Greely, Alaska.

Table A

Fort Greely Data

Sample Point	Report Period Quarters 1968			
	1st	2nd	3rd	4th
Water Samples (unit x 10^{-8} µCi/ml)				
101	*	2.34	2.74	<1.36
102	*	2.46	3.48	1.64
103	*	2.08	3.09	*
104	2.33	<1.85	2.71	<1.36
Gum Paper Particulate (unit x 10^{-5} µCi/ft^2)				
401	2.73	3.29	2.83	2.05
402	4.16	5.05	3.52	1.82
403	5.45	2.92	2.89	<0.74
404	8.14	3.71	3.04	1.91
405	3.05	3.40	3.40	1.58
406	3.65	3.43	3.59	1.83
407	1.80	3.54	3.33	1.04
408	4.24	4.11	3.50	1.57
409	3.04	4.65	4.37	2.61
Air Samples (unit x 10^{-12} µCi/cc)				
201	< 4.63	< 3.63	2.74	0.92
202	< 4.63	< 3.63	2.20	1.31

Table A (continued)

Sample Point	Report Period Quarters			
Soil Samples (unit x 10-6 μCi/gm)	1st	2nd	3rd	4th
301	*	*	*	*
302	*	*	*	*
Fish Samples (unit x 10-6 μCi/gm)				
Tanana River	*	*	*	*
Sediment Samples (unit x 10-6 μCi/gm)				
701	*	*	*	*
702	*	*	*	*
703	*	*	*	*

*None Collected

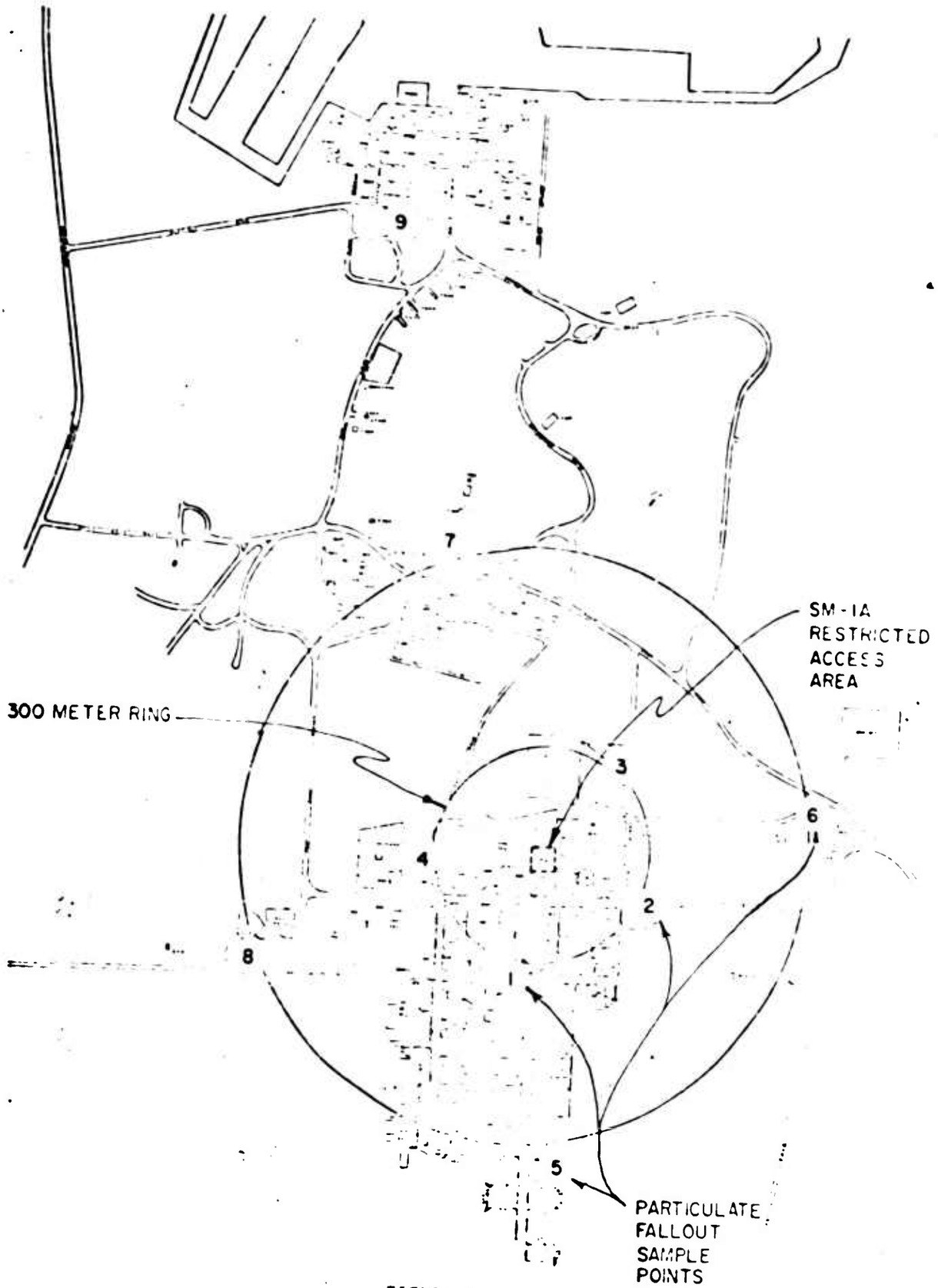

FIGURE 1
SITE PLAN
FORT GREELY, ALASKA

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